

TEST INSTRUMENTS

Arrange Test Instruments
More EfficientlyMartin Rowe
Technical Editor

You've probably wasted time searching your benches for that elusive scope or meter probe. You also never seem to have enough bench space, right? And even when you have enough space, you often find that you can't keep your eyes on that scope screen or DMM display while making adjustments to circuits. If you're tired of having a second career as a contortionist, then try some of the tips I've compiled for arranging your work area.

Perhaps the largest piece of test equipment on your bench—and the one you use the most—is your oscilloscope. You can save acres of bench space if you could just put that scope somewhere else. Fortunately, you have several options.

One option is to use a scope cart. Scope carts not only get the scope off your bench, but they also let you roll the scope around. When you're not using the scope, a colleague can roll it to his or her work area. Unfortunately, placing a scope on a cart often means the scope screen is no longer in the same line of view as the circuit you're probing.

Another option is to place your scope on a computer monitor arm, which lets you place the scope's screen in a line behind or over your circuit. **Figure 1** shows that you can move the scope up and out of your way when it is not in use.

When you move the scope out of your way, don't disconnect the probes. Instead, attach a tube to the top of your scope—one for each probe—and slide the unused probe into the tube. You can use the cardboard core from a roll of

fax paper to hold a probe. Or, use a piece of thin-wall aluminum tubing.

If you're left-handed, then you know that all scope manufacturers design their scopes for right-handed people. Whenever you try to adjust a scope with your left hand, your arm blocks the scope's screen. Try placing your left elbow on top of the scope and adjusting the scope's vertical and horizontal sensitivity knobs with your thumb. Unfortunately, if you want to do this, you can't stack anything else on top of the scope. Lefties can also use an external VGA monitor with many digital scopes. With an external monitor, you can view waveforms without your left arm blocking your view when you adjust the knobs.

You can also save bench space by using stackable equipment. Stacking equipment certainly saves bench space, but it makes the equipment hard to move—especially if you need to move that scope or power supply to another bench. Try arranging your bench in a U shape around you. Doing so can minimize stacking of equipment and keeps all of your equipment within easy reach.

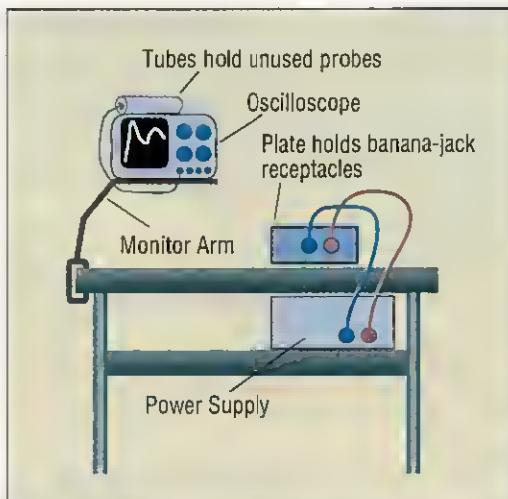


FIGURE 1. Mounting test equipment above and below a bench saves bench space.

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WAVECREST's Jitter Analysis 101 seminars provide a learning experience for understanding the concepts of Jitter, techniques for identifying the components of Jitter, and tools needed to deal with complex Jitter problems.

Timing irregularities caused by Jitter are becoming a critical performance parameter. Engineers need an understanding of Jitter in order to identify and correct potential Jitter problems in the design process, while working to eliminate the potential of releasing a Jitter problem to production.

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For more information on **WAVECREST** Jitter seminars, please contact us at our Edina, Minnesota office or San Jose, California office:

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TEST TIPS & TECHNIQUES

See Clearly

If you use handheld meters on your bench and wear bifocals, then viewing the meter's display using the upper part of the lens can be difficult. Try placing your handheld meters near the edge of the bench closest to you. Then, you can just look down and get a clear view of the meter's display.

Some equipment needn't consume valuable bench space. If you use a power supply at the same voltage all the time, then you can move the supply under your bench. Get a scope stand or other platform, place the power supply under the bench, and bring the supply leads to the bench top.

Figure 1 also shows that you can make a plate for banana-jack receptacles that gives you access to the supply under the bench. You can bend the plate so it stands upright, or you can screw-mount it to a vertical surface. Drill quarter-inch holes for the banana-jack receptacles, and drill the holes three quarters of an

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inch apart center-to-center. That distance lets you use a dual banana-jack plug that you can attach to a shielded cable through a BNC connector. You can then attach a BNC-to-clip-lead adapter and connect the power supply to your circuit.

Building the plate gets the power supply off the bench, but the additional wire can cause voltage drops because of the wires' resistances and the amount of current they'll carry. If the additional wire length causes an unacceptable voltage drop, then drill two more holes in the plate for voltage-sense leads, and connect the sense wires to the circuit you want to power along with the power leads. Now, the supply will sense the voltage at the plate and compensate for losses.

While the plate holds wires from the power supply, you still need to connect your test equipment to your circuits. Often, you find that the wire, clip, or probe is never in sight when you need it. By organizing your probes with hooks, you'll always know where to look.

Organizing your test equipment and placing instruments in convenient places saves bench space and puts screens and displays where you can best view them. Hooks can help keep probes off your bench, too. If you have a tip for arranging test equipment, we'd like to hear from you. Contact me by fax at 617-558-4470 or by e-mail at mr@tmw.rahmers.com. **T&MW**

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